

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) A pass/fail judgment device comprising:

a discriminant function computing unit for computing discriminant functions which give variables used to separate the frequency distributions of a pass category and a fail category from a plurality of pieces of parameter information which make pass/fail judgment factors and pass/fail judgment result information thereof;

a statistical parameter computing unit for computing ~~the~~ a center of distribution and distribution parameters indicating ~~the~~ a breadth of ~~the~~ a distribution for said variables with respect to either or both of said pass category and said fail category;

a threshold determining unit for taking as a threshold for a pass/fail judgment the value of ~~said a variable which gives~~ and giving a specific distribution probability based on at least one of a rate of overcontrol in the pass category and a rate of flowout in the fail category ~~in either or both of said categories~~ based on said center of distribution and said distribution parameters;

a parameter information acquiring unit for acquiring a plurality of pieces of parameter information on pass/fail judgment objects; and

a pass/fail judging unit for comparing the value of ~~said variable~~ variables obtained by substituting the parameter information into said discriminant function with said threshold and for thereby ~~makes~~ making the pass/fail judgment.

2. (Currently Amended) The pass/fail judgment device according to Claim 1, wherein

said statistical parameter computing unit computes ~~the~~ a mean and standard deviation of said fail category, and

said threshold determining unit takes as said threshold said variable value equivalent to a value which is away from said mean of said fail category by a constant multiple of the standard deviation thereof.

3. (Currently Amended) The pass/fail judgment device according to Claim 2, wherein

said statistical parameter computing unit computes the mean and standard deviation of said pass category, and

said threshold determining unit judges by what multiple of the standard deviation the threshold determined by said mean and standard deviation of said fail category is away from said mean of said pass category, and thereby computes a rate of occurrence of said overcontrol with that threshold.

4. (Currently Amended) The pass/fail judgment device according to Claim 1, wherein

a plurality of pieces of said parameter information is obtained by converting specified inspection data obtained as the result of inspecting a plurality of said pass/fail judgment objects with a specified inspecting instrument in advance into parameters

which represent different pass/fail judgment factors by a plurality of different conversion expressions, and is stored in a specified storage medium, and

a plurality of pieces of parameter information on said pass/fail judgment objects acquired by said parameter information acquiring unit and the results of pass/fail judgment by said pass/fail judging unit are additionally stored in the specified storage medium.

5. (Currently Amended) The pass/fail judgment device according to Claim 4, wherein

the judgment device comprises a unit for inputting the results of visual pass/fail judgment on said pass/fail judgment objects,

said pass/fail judgment result information indicating the results of said visual pass/fail judgment is correlated with the parameter information on said pass/fail judgment objects, and

if the results of pass/fail judgment by said pass/fail judging unit and the results of said visual pass/fail judgment are ~~discrepant~~ different from each other, the results of the visual pass/fail judgment are additionally stored as correct judgment results in said specified storage medium.

6. (Original) The pass/fail judgment device according to Claim 4, wherein the judgment device comprises a unit for inputting the causes for visual pass/fail judgment and the results of the visual pass/fail judgment on said pass/fail judgment objects,

either or both of said pass category and fail category are subdivided by cause for the pass/fail judgment and taken as said pass/fail judgment result information, and

said discriminant function computing unit computes discriminant functions which give variables which separate the frequency distributions of the subdivided pass category and fail category.

7. (Currently Amended) The pass/fail judgment device according to ~~any of~~ Claim 1, wherein

in computing discriminant functions having as a variable any of a plurality of said parameters, the discriminant function computing unit computes correlation coefficients between the parameters, counts the number of parameters which give a correlation coefficient not less than a predetermined value in said pass category and said fail category, disuses parameters having a high count, and repeats this processing to eliminate multicollinearity.

8. (Original) The pass/fail judgment device according to Claim 1, wherein in computing discriminant functions having as a variable any of a plurality of said parameters, said discriminant function computing unit disuses parameters in increasing order of priorities given to the parameters in advance, and repeats this processing to eliminate multicollinearity.

9. (Original) The pass/fail judgment device according to Claim 1, wherein the judgment device comprises:

an electromagnetic wave applying unit for irradiating pass/fail judgment objects with predetermined electromagnetic waves;

an electromagnetic wave detecting unit for detecting reflected electromagnetic waves or transmitted electromagnetic waves produced as the result of the application of the electromagnetic waves; and

an electromagnetic wave data generating unit for generating electromagnetic wave data from the detection values of reflected electromagnetic waves or transmitted electromagnetic waves detected by the electromagnetic wave detecting unit, and

said discriminant function computing unit and said parameter information acquiring unit substitute said electromagnetic wave data into a plurality of different conversion expressions to compute values corresponding to the forms of pass/fail judgment objects, and take the computed values as a plurality of pieces of said parameter information.

10. (Original) The pass/fail judgment device according to Claim 9, wherein the judgment device comprises:

a positional information acquiring unit for acquiring positional information on pass/fail judgment objects; and

an arrangement analyzing unit for, when electromagnetic waves reflected by a plurality of pass/fail judgment objects more than once are detected by said electromagnetic wave detecting unit, grasping the arrangement of the pass/fail judgment objects from said positional information, and

said discriminant function computing unit disuses or gives lower priorities to said parameters to which said electromagnetic waves reflected more than once greatly contribute.

11. (Currently Amended) A pass/fail judgment program wherein the judgment program causes a computer to carry out a method comprising the steps of:

~~a discriminant function computing function of computing discriminant functions~~ which give variables which separate the frequency distributions of a pass category and a fail category from a plurality of pieces of parameter information which make pass/fail judgment factors and pass/fail judgment result information thereof;

~~a statistical parameter computing function of computing~~ a center of distribution ~~and distribution parameters indicating the center of distribution for said variable and~~ ~~distribution parameters indicating the~~ a breadth of the a distribution for said variables with respect to in either or both of said pass category and said fail category;

~~a threshold determining function of taking as a threshold for a~~ pass/fail judgment ~~said the value of a~~ variable value which gives and giving a specific distribution probability based on at least one of a rate of overcontrol in the pass category and a rate of flowout in the fail category in either or both of said categories based on said center of distribution and said distribution parameters;

~~a parameter information acquiring function of acquiring a plurality of pieces of~~ said parameter information on pass/fail judgment objects; and

~~a pass/fail judging function of~~ comparing the value of said ~~variable~~ variables obtained by substituting the parameter information into said discriminant functions with said threshold and thereby making the pass/fail judgment.

12. (Currently Amended) A pass/fail judgment method ~~wherein the judgment method comprises~~ comprising;

a discriminant function computing ~~process~~ step in which discriminant functions which give variables which separate the frequency distributions of a pass category and a fail category are computed from a plurality of pieces of parameter information which make pass/fail judgment factors and pass/fail judgment result information thereof;

a statistical parameter computing ~~process~~ step in which ~~the~~ a center of distribution and distribution parameters indicating ~~the~~ a breadth of ~~the~~ a distribution for said ~~variable~~ variables are computed with respect to either or both of said pass category and said fail category;

a threshold determining ~~process~~ step in which ~~said a value of a variable value~~ which gives a specific distribution probability ~~in either or both of said categories is taken as a threshold for pass/fail judgment~~ based on at least one of a rate of overcontrol in the pass category and a rate of flowout in the fail category based on said center of distribution and said distribution parameters.

a parameter information acquiring ~~process~~ step in which a plurality of pieces of said parameter information on pass/fail judgment objects are acquired; and

a pass/fail judging ~~process~~ step in which the value of ~~said variable~~ variables obtained by substituting the parameter information into said discriminant ~~function~~ functions are compared with said threshold, and a pass/fail judgment is thereby made.

13. (Currently Amended) A multivariate statistics analyzer which is capable of communication of data with the outside through a communication interface and executes a multivariate analysis program under the control of a predetermined operating system, wherein

said multivariate statistics analyzer comprises a hard disk drive which is capable of accumulating the multivariate analysis program and transmitting, receiving, and accumulating data,

said multivariate analysis program comprises modules corresponding to

a mode classifying portion which includes parameter value data consisting of parameter values which are correlated with at least pass/fail judgment result data when data is externally acquired through said communication interface and stored in said hard disk drive and are actually computed with respect to each component, and subdivides categories based on the accumulated data;

a discriminant function computing portion which eliminates multicollinearity and further computes discriminant functions based on said parameter value data;

a statistical parameter computing portion which computes ~~statistical~~ a center of distribution parameters and including a breadth of a distribution for variables with respect to either or both of a pass category and a fail category, and the mean and

standard deviation in the frequency distributions of said pass category and said fail category with respect to said discriminant functions; and

a threshold determining portion which takes as a threshold for a pass/fail judgment the value of a variable giving a specific distribution probability based on at least one of a rate of overcontrol in the pass category and a rate of flowout in the fail category based on said center of distribution and said distribution parameter ~~utilizes the statistical parameters to determine a threshold~~, and

the threshold determining portion further performs the operations of acquiring said discriminant function data, said parameter value data, and pass/fail judgment result data to make a pass/fail judgment, and generating a histogram corresponding to the judgment result on a category-by-category basis;

computing ~~the~~ a mean and a standard deviation of each category in the thus generated histogram; and

determining the threshold of a discriminant function corresponding to a specified rate of flowout which is set for the fail category and indicates the range in which defective units are let out, based on the mean and standard deviation computed in the fail category and the rate of flowout.

14. (Original) The multivariate statistics analyzer according to Claim 13, wherein

said threshold determining portion is externally fed with said rate of flowout and determines the threshold of said discriminant function so that the inputted rate of flowout will be obtained.

15. (Original) The multivariate statistics analyzer according to Claim 14, wherein

said threshold determining portion determines as a threshold the range from the mean to four times the standard deviation which is considered to be the range corresponding to said rate of flowout.

16. (Currently Amended) The multivariate statistics analyzer according to Claim 13, wherein

said threshold determining portion judges the suitability of said determined threshold of discriminant function based on the mean and standard deviation computed in a pass category and **[[a]]** said specified rate of overcontrol which is set for said pass category and indicates the range in which non-defective units are judged as defective units.

17. (Original) The multivariate statistics analyzer according to Claim 16, wherein

said threshold determining portion judges the suitability of said threshold depending on whether the threshold falls in the range from the mean to nine times the standard deviation which is considered to be the range corresponding to said rate of overcontrol.